

Document Review Comment
Record of EPA and CDH
Comments on the

DRAFT WORKPLAN FOR THE
CONTROL OF RADIONUCLIDE LEVELS
IN WATER DISCHARGES FROM
THE ROCKY FLATS PLANT

Rocky Flats Plant
Golden, Colorado

As Required by
Section XII of the Statement of Work to
the Interagency Agreement
(January 22, 1991)

U.S. DEPARTMENT OF ENERGY
Rocky Flats Plant
Golden, Colorado

EG&G Rocky Flats
Environmental Management Program

September 1991

ADMIN RECORD

A-SW-000154

Document Review Comment
Record of EPA and CDH
Comments on the

DRAFT WORKPLAN FOR THE
CONTROL OF RADIONUCLIDE LEVELS
IN WATER DISCHARGES FROM
THE ROCKY FLATS PLANT

Rocky Flats Plant
Golden, Colorado

As Required by
Section XII of the Statement of Work to
the Interagency Agreement
(January 22, 1991)

U.S. DEPARTMENT OF ENERGY
Rocky Flats Plant
Golden, Colorado

EG&G Rocky Flats
Environmental Management Program

September 1991

ADMIN RECORD

REVIEWED FOR CLASSIFICATION/UCR
By F. J. Curran 0-70
Date 10-10-91

Record of Response to Comments

Page 1 of 15

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: EPA, Region VIII

Date: 10/9/91

Citation	Comment/Issue	Disposition
Ref: 8HWM-FF Cover ltr, ¶ 2	In general, our comments reflect EPA's concern that the draft workplan seems to contend the applicability of the standards for radionuclide levels established by the Colorado Water Quality Control Commission (CWQCC) for Walnut Creek and Woman Creek.	The intent was not to criticize the discharge limits, but to illustrate that the CWQCC site specific standards for radionuclide levels are unusually strict, and to express the concern that the comparatively high level of measurement uncertainty or analytical error may be misinterpreted as out-of-compliance with the standards.
Ref: 8HWM-FF Cover ltr, ¶ 2	EPA suggests that the revised workplan focus more on specific, detailed tasks for accomplishing the required objectives.	In the newer September 16, 1991 version Sections 1, 2, and 3 continue to serve as historical and descriptive narratives of the RFP from a water management perspective. However, Section 4 of this document has been rewritten to emphasize and expand upon the actual plans and work proposals designed to improve the control of radionuclide levels in discharges of water from RFP.
Ref: 8HWM-FF Cover ltr, ¶ 3	Another item of general concern which is also reflected in the enclosed comments is the integration of the evaluation of various treatment technologies for surface water with the ongoing site wide treatability study, also an IAG program. The revised workplan must provide more detail demonstrating an integration of the two programs as appropriate.	Although a number of the activities described in Section 3 of the Workplan pre-date the IAG, there is a continuing effort to coordinate Clean Water Act and the Sitewide Treatability Study Plan activities. The September 16, 1991 version of the Workplan describes this coordination.
Ref: 8HWM-FF Attachment 1 Page 1, ¶1	<u>Page 6, last paragraph:</u> Here and in other parts of the text information from draft documents is referenced. Draft documents are not considered to be adequate references. DOE must provide an appropriate reference for the information on this page and in other parts of the text.	DOE recognizes the importance of proper citations and will reference these when available. Unfortunately, when references are made to recent or concurrent tasks/activities/documents, final documents may not be available and citation is included for completeness. In the September 16, 1991 version of the Workplan, revisions to the references were made to include final documents as possible.

Record of Response to Comments

Page 2 of 15

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: EPA, Region VIII

Date: 10/9/91

Ref: 8HWM-FF Attachment 1 Page 1, ¶2	<u>Page 11. Paragraph 2:</u> As part of the surface water hydrology discussion, this paragraph discusses ditches and diversions. It would be helpful to have a more detailed map of ditches and diversions showing source and direction of water flow.	In the September 16, 1991 version of the Workplan, Surface Water Features, Figure 2.5, was enlarged to provide details such as the locations of the ditches and diversions with arrows designating the flow directions.
Ref: 8HWM-FF Attachment 1 Page 1, ¶3	<u>Page 12. Paragraph 1:</u> The text refers to the landfill pond located downgradient from the present landfill. The landfill pond is not shown on Figures 2.5 or 2.6 and should be added.	In the September 16, 1991 version of the Workplan, the landfill pond was added to Surface Water Features, Figure 2.5 .
Ref: 8HWM-FF Attachment 1 Page 1, ¶4	<u>Page 17. Table 2.2:</u> The proposed MCL for uranium is 20 pCi/L. Delete the reference to 40 pCi/L as the SDWA standard and use 20 pCi/L. Also, this table should list the plutonium and uranium isotopes for analysis as it does for all other elements listed in the table.	The reference to 40 pCi/L has been deleted. While isotopic analysis of pond water includes U-233, -234, and -238, as well as Pu-239 and -240, the CWQCC standards for these radionuclides are not isotope-specific. The majority of alpha activity from these species arises from U-238 and Pu-239,-240. DOE is also aware of newer proposed state-wide radionuclide standards to be considered by CWQCC in October 1991
Ref: 8HWM-FF Attachment 1 Page 1, ¶5	<u>Page 22. Paragraph 3:</u> The paragraph states that ponds A-4, B-5, and C-2 were designed to contain the 100-year rainfall. A table with expected runoff volumes for various-sized storms (for example, a 24-year, 2-hour or 2-year, 2-hour) and pond volumes would help quantify the available holding capacity for each system.	The text should reference a design to the 100 year/3 day event. The correlation of rainfall with runoff volumes is highly variable depending on factors such as soil moisture and conductivity, uniformity of rainfall patterns and rates, and changes in drainage patterns—factors not yet well defined by RFP. A new study to update pond levels vs. volumes is nearing completion, and the September 16, 1991 version of the Workplan does not yet included the requested table.

Record of Response to Comments

Page 3 of 15

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: EPA, Region VIII

Date: 10/9/91

Ref: 8HWM-FF Attachment 1 Page 1, ¶6	<u>Page 27, Section 3.2.4, Water Sampling and Analysis:</u> The first paragraph of this section states that water samples are analyzed according to established protocols by two or three independent analytical organizations. Please indicate in the text what the established protocols are and which organizations perform the analytical work.	This section was reworded to improve clarity and is incorporated in the September 16 version of the Workplan. Three laboratories—RFP H&S Lab, a sub-contracted lab, and CDH—analyze for radionuclides. Contracted laboratory services conform to the EG&G/Environmental Management's GRRASP protocol. GRRASP details the RFP requirements that analytical laboratory subcontractors must meet for sample analysis, deliverables, and documentation.
Ref: 8HWM-FF Attachment 1 Page 1, ¶7	<u>Page 27, Paragraph 3:</u> This paragraph provides a formula for determining the minimum detectable activity (MDA). Provide a reference for this formula and also an analysis of the units of measure for each parameter. As it is now written, the units do not result in the units of MDA of activity per volume or weight.	Calculations of this sort are unit-less, typically corrected to by a conversion factor, here "a". Intermediate values are usually corrected to "unit activity," e.g., standard deviation of the sample blank (S _B) is entered as d/m, but corrected by division by 1.0 d/m, prior to mathematical manipulation.
Ref: 8HWM-FF Attachment 1 Page 1, ¶8	<u>Page 28, Paragraph 3:</u> The text indicates that data are evaluated by statistical methods to discard outliers. Include the exact statistical methods which DOE uses to perform this evaluation.	This discussion occurs in Section 3.2.2 of the September 16, 1991 version of the Workplan. Rosner's test for detecting multiple outliers is used. Refer to "Statistical Methods for Environmental Pollution Monitoring," R.O. Gilbert, page 189.
Ref: 8HWM-FF Attachment 1 Page 2, ¶1	<u>Page 30, Paragraph 2:</u> This paragraph discusses the disadvantages of utilizing larger sample volumes and longer counting times to lower MDAs. The text states that the advantages of larger sample size and increased counting times to improve MDAs are offset by factors such as time and resource requirements, and that throughput and turnaround are optimized by using 1-liter sample volumes. Because increased sample size and longer counting times are the only way to reduce MDAs and therefore avoid problems with samples which exceed discharge standards, dismissing these strategies should be more thoroughly justified.	This discussion now appears in Section 3.2.2 with additional discussion of improving analytical performance occurring in Section 4.3.4 of the September 16, 1991 version of the Workplan. RFP is evaluating the use of larger (5- to 7-liter) samples by on-site laboratories and will evaluate the results obtained in comparison to a 1-liter sample size. Due to the large sample load and limitations of current capacity, it is not deemed practical to substantially increase counting times.

Record of Response to Comments

Page 4 of 15

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: EPA, Region VIII

Date: 10/9/91

Ref: 8HWM-FF Attachment 1 Page 2, ¶2	<u>Page 37, Paragraph 3:</u> The text suggests that higher mean uranium levels such as those found in Walnut Creek may be attributable to natural deposits of uranium. Analyzing the isotopic composition of the uranium in the ponds would help determine if it is naturally or isotopically enriched or depleted.	Although RFP concurs with the recommendation (the same one which was made by the Governor's Scientific Panel on Monitoring Systems), the revised Workplan (Section 3.2.3) contains no reference to identifying source terms. The revised Isotopic analysis of the ponds is conducted for U-233, -234, and -238, as well as Pu-239 and -240.
Ref: 8HWM-FF Attachment 1 Page 2, ¶3	<u>Page 38, Paragraph 1:</u> This paragraph discusses the skewed nature of the ambient water quality data and its effect on the percentage of samples which exceed discharge standards. The work plan does not present a histogram of these data in this section or in the appendix. The validity of this statement cannot be demonstrated. Present the histogram or other plot in this section or in the appendix.	This reference to skewedness of the historical data specifically used to derive CWQCC standards was deleted from the September 16, 1991 version of the Workplan. Histograms of data for a variety of locations and analytes are presented in Appendix II; these data sets often do show skewed behavior.
Ref: 8HWM-FF Attachment 1 Page 2, ¶4	<u>Page 38, Paragraph 2:</u> The last sentence in this paragraph states that "significant percentages" of single sample exceedence are found in offsite water for plutonium and americium levels. The corresponding tables do not support this statement. 2.3% - 2.7% does not appear to be significant. Provide a statistical basis for this statement or delete it.	This discussion was moved to Appendix II and the use of the term "significant" was deleted from the September 16, 1991 version of the Workplan. The intent of this discussion was to focus on "non zero" or "measurable" percentage and not "statistical significance." Since offsite waters would not be expected to exceed standards, any exceedence is unusual, and single value exceedence are observed (measurable) 2.3 % - 2.7% of the time using current analytical methods.
Ref: 8HWM-FF Attachment 1 Page 2, ¶5	<u>Pages 39 - 41, Tables 3.6 - 3.8:</u> It is not clear where the data in the "others" row came from. Please indicate whether or not this data is also extracted from the monthly information reports. If it is not, provide a reference for the data. It is also not clear from the tables whether these data are for 1 liter or 5 liter samples. List the sample size at the bottom of the table.	Tables were moved to Appendix II in the September 16, 1991 version of the Workplan. As indicated in the footnote, the "other locations" includes the South Boulder Diversion Canal, Ralston Reservoir, Dillon Reservoir, and Boulder Reservoir and data are taken from monthly reports. All data is from 1-liter samples. See Response immediately above for more information.

Record of Response to Comments

Page 5 of 15

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: EPA, Region VIII

Date: 10/9/91

Ref: 8HWM-FF Attachment 1 Page 2, ¶6	<u>Page 41, Paragraph 1:</u> The text states the 30-day running average for radionuclide levels in streams routinely meets CWQCC standards. The reader is subsequently referred to Appendix II. However, no plot or data table with the 30-day average is provided in the text or tables of Appendix II. Without a plot of the data, this statement is unsubstantiated.	The results of applying a 30-day moving average to Pu concentrations in water discharged from Pond A-4 are shown in Figure II-7 of Appendix II, with a verbal explanation of this figure in the preceding page.
Ref: 8HWM-FF Attachment 1 Page 2, ¶7	<u>Page 41, Section 3.3.4, Conclusions of Statistical Study:</u> Delete the last two sentences of the first paragraph of this section (beginning, "These radionuclide levels..."). The information is irrelevant to the issue of compliance with the CWQCC stream standards.	These two sentences, referring to the DCGs, have been deleted from the latest version.
Ref: 8HWM-FF Attachment 1 Page 3, ¶1	<u>Page 42, Paragraph 1:</u> The first full sentence in this paragraph does not make sense as it is written. It appears that it should have been written as, "Frequency distributions for the radionuclide data show non-normal characteristics which suggest that careful consideration of actions or reactions based on single value exceedences is appropriate." However, the validity of this statement even when corrected is not supported without the data. DOE must provide the data, the statistical methods, and the resulting distribution functions from which these conclusions were drawn.	The frequency distributions/histograms (still appearing in Appendix II) indicate skewed behavior leading to possible single-sample exceedences whose cause might be nothing more than analytical variability. Workplan Section 3.2.3.5 (Conclusion of Statistical Studies) and Appendix II (including histograms) were rewritten and expanded to increase clarity.
Ref: 8HWM-FF Attachment 1 Page 3, ¶2	<u>Page 42, Paragraph 2:</u> Delete this paragraph in its entirety. The statement contained in this paragraph is speculative and cannot be supported by existing data.	This paragraph has been deleted in the latest version of the Workplan.

Record of Response to Comments

Page 6 of 15

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: EPA, Region VIII

Date: 10/9/91

<p>Ref: 8HWM-FF Attachment 1 Page 3, ¶3</p>	<p><u>Page 42. Simple Filtration/Filter Bag Evaluations:</u> The text does not indicate that either the initial evaluation of treatment technologies or the subsequent field testing discussed in this section have been published or reviewed by any agency. DOE must provide the details of the evaluation criteria, the technologies which were considered, the design of the field investigations, the resulting data, and the evaluation of the results. As it is currently written, the draft workplan gives no indication of what DOE considered to be "anticipated reduction" or an effective treatment technology. There is also no indication that this field test was coordinated with site wide treatability studies. EPA believes that such coordination should routinely be accomplished to minimize duplication of effort and to maintain consistency between these two programs.</p>	<p>These evaluations were conducted in February 1990 and pre-date the IAG and, therefore, no site-wide efforts existed. These filter evaluations were conducted to provide immediate answers in response to the imminent requirement to release pond water in compliance with the promulgated CWQCC standards. Evaluations were conducted on a fast turnaround to evaluate immediately available methods to remove particulates (and potentially, radionuclides) from pond water prior to its imminent discharge. Time frame of the required action allowed only gross alpha and gross beta parameters to be evaluated <i>before</i> full-scale treatment was put in place. <i>Initial</i> indications showed diminished gross alpha levels following filtering, but subsequent radiochemical analyses failed to substantiate these earlier results. This section was rewritten for the September 16, 1991 Workplan to improve clarity.</p>
<p>Ref: 8HWM-FF Attachment 1 Page 3, ¶4</p>	<p><u>Page 43. Paragraph 2:</u> Quantify "effectively reduced".</p>	<p>This section was rewritten for the September 16, 1991 Workplan to improve clarity. Also see previous response.</p>
<p>Ref: 8HWM-FF Attachment 1 Page 3, ¶5</p>	<p><u>Page 43. Contracted Radionuclide Removal Study:</u> The validity of utilizing knowledge and experience about removal of uranium to simulate removal of actinides is questionable given the fact that uranium exists as an anion. Without additional information, EPA cannot concur with this assumption. It is unclear how DOE plans to extrapolate results of field testing or uranium to other radionuclides. Provide these details in the final workplan.</p>	<p>This section was rewritten for the September 16, 1991 Workplan (see Section 3.4.4). The referenced study was initiated in Summer 1990 and used available subcontractor resources and knowledge to evaluate options for treatment and provide a starting point for planning future treatability tests. The assumptions and limitations of using knowledge based on uranium systems was acknowledged by authors of the study and by RFP. This preliminary study in combination with other information was used to establish a pre-IAG treatability plan for removing radionuclides from pond water.</p>

Record of Response to Comments

Page 7 of 15

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: EPA, Region VIII

Date: 10/9/91

Ref: 8HWM-FF Attachment 1 Page 3, ¶6	<u>Page 43, Paragraph 5:</u> What criteria was used to evaluate performance?	This section was rewritten to improve clarity of the September 16, 1991 Workplan (see Section 3.4.4).
Ref: 8HWM-FF Attachment 1 Page 3, ¶7	<u>Page 44, Paragraph 3:</u> Provide more information about how the proposed treatment evaluations will be integrated with the treatability studies being conducted under the sitewide treatability studies plan.	There is ongoing communication with project manager of the site-wide treatability studies in order to minimize duplication of effort and integrate the two programs. Further discussion is provided in Section 4.4.3 of the revised Workplan.
Ref: 8HWM-FF Attachment 1 Page 3, ¶8	<u>Page 46, Paragraph 3:</u> Delete the last sentence in this paragraph. Variability due to sample sedimentation and mixing phenomena in the water source is minimized by proper sampling techniques. Contrary to the implication in this paragraph, this variability is no greater in the case of "sub-pCi/L radionuclide determinations" than other radionuclides determinations.	This sentence has been deleted. However, the original intent was to show there is a greater variability when a single particle is encountered in water with sub-pCi/L radionuclides than in water with high pCi/L radionuclides. For example, if the average Pu level is 0.001 pCi/L, then a single contaminant particulate measuring 1 pCi would increase the relative variability more than if the water contained an average Pu level of 5 pCi/L. See Section 3.2 of the revised Workplan for further discussion.
Ref: 8HWM-FF Attachment 1 Page 4, ¶2	<u>Page 47, Paragraph 2:</u> EPA strongly disagrees with the statement contained in this paragraph that "only by comparison to ambient levels in local areas removed from potentially impacted zones can the need for action be established". Corrective action or remediation is dependent on protection of human health and the environment. The consideration of background levels is one of many factors used in the determination of remedial action levels but it is not the criteria for taking action. Delete this paragraph from the text.	This paragraph has been deleted from the revised Workplan.

Record of Response to Comments

Page 8 of 15

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: EPA, Region VIII

Date: 10/9/91

Ref: 8HWM-FF Attachment 1 Page 4, ¶3	<u>Page 49. Section 4.1.3. Runoff vs. Pond Level Model:</u> Provide a reference for the model used to predict pond levels as a function of precipitation and discharge rates.	This section has been rewritten in the revised Workplan. At present a simple empirical model based on mean rainfall and pond level is used. Historical topographic contours of the ponds in conjunction with precipitation data are used to anticipate future pond levels and release dates. These calculations are tracked by physical checks of the actual pond levels.
Ref: 8HWM-FF Attachment 1 Page 4, ¶4	<u>Page 50. Paragraph 1:</u> EPA does not believe that the discussions on sampling contained in this workplan satisfy the expectations of the IAG for this document. We believe that a sampling plan needs to be developed and presented in this workplan. Include detailed schedules (including contingencies for storm events or emergency discharge) for surface water sampling. Similarly, the work plan should clearly delineate sampling locations and sampling procedures (including methods, volumes, and equipment). Detailed schedules, procedures, and locations are essential for adequate implementation of the work plan and characterization of the site.	Section 3.2.2 and Appendix IV, the Quality Assurance Addendum provide references to surface water and related sampling protocols and standard operating procedures (SOPs) used at the RFP. These SOPs include, but are not limited to the following: Sampling of Incidental Waters, Industrial; Effluent and Pond Discharge Sampling, River and Ditch Sampling. A stormwater sampling procedure is still in draft form.
Ref: 8HWM-FF Attachment 1 Page 4, ¶5	<u>Page 50. Split Sampling:</u> Provide detail about how coordination will be accomplished (via telephone call, correspondence, etc.) and in what timeframe.	Coordination of split sampling is accomplished by a telephone one week in advance of the scheduling for predischage sampling.
Ref: 8HWM-FF Attachment 1 Page 4, ¶6	<u>Page 50. Representative Sampling:</u> Provide detail on how representativeness will be determined.	In this case representativity is better described as appropriate and sufficient rather than implying statistically determined. Sampling procedures are referenced in Appendix IV. In general, a representative sample for pre-discharge is one that is depth-composited into a single grab sample, whereas, discharge samples are time-composited over the period of the discharge, typically into weekly samples.

Record of Response to Comments

Page 9 of 15

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: EPA, Region VIII

Date: 10/9/91

<p>Ref: 8HWM-FF Attachment 1 Page 4, ¶7</p>	<p><u>Page 50, Paragraph 3:</u> This paragraph discusses using a 30-day running average to determine if CWQCC standards have been exceeded. Using a 30-day running average, all or nearly all results for any of the radionuclides of interest will fall below the CWQCC standards. Also, use of this system may allow for several days of discharge above CWQCC standards before the 30-day running average is exceeded for any individual element. Also, because of the 15- to 30-day turnaround time between sampling and receiving results, several days of standard exceeding discharges could occur before the discharge is stopped. DOE must revise the workplan to include a sampling plan designed to detect radionuclide levels above the CWQCC standards quickly and to provide for immediate cessation of discharge. EPA suggests that DOE consider a plan in which three consecutive single samples which exceed discharge standards or a predetermined percentage increase in the 30-day average will trigger discharge stoppage.</p>	<p>The inadequacy of available analytical methods is a key Workplan issue: RFPs best non-routine analytical turnaround for Pu and Am requires 7-10 days and is similar in time requirement to CDH. Clearly, improvements in accuracy and turnaround time are required for demonstrating timely compliance. Plans to improve analytical performance are discussed in Section 4.3 of the revised Workplan. Section 4.3.5, Goals and Targets for Analytical Improvements, lists four definitized targets. Decreasing turnaround time and providing real-time radiometric measurements are two of these targets. The proposals for these targets are described in more detail in following sections.</p>
<p>Ref: 8HWM-FF Attachment 1 Page 5, ¶2</p>	<p><u>Page 51, Paragraph 3:</u> In the event of an exceedence of the CWQCC standards for water being discharged, the text indicates that RFP will "confer regarding the advisability of continued discharge..." With what agency will RFP confer and in what form will the notification be?</p>	<p>The description of the current pond discharge process is provided in Section 3.3 in the revised Workplan. Specifically, EG&G notifies DOE-RFP via telephone, who makes concurrent notifications to CDH, EPA, and local municipalities via telephone.</p>
<p>Ref: 8HWM-FF Attachment 1 Page 5, ¶3</p>	<p><u>Page 53, Paragraph 2:</u> This paragraph discusses resumption of discharge activities following a shut down as a result of potential water quality concerns. It is unclear whether resumption of water discharge is determined by RFP personnel as soon as the 30-day running average returns to levels below CWQCC standards, or if Colorado Department of Health (CDH) approval will always be required.</p>	<p>CDH continues to review and provide concurrence to RFP for resumption of pond discharge, and to request further information and/or corrective actions on the part of RFP, as required. Resumption of any discharge by RFP would be expected to receive concurrence from CDH and occur at such time as the running 30-day average radiochemical parameters return to levels at or below those of the CWQCC standards.</p>

Record of Response to Comments

Page 10 of 15

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: EPA, Region VIII

Date: 10/9/91

<p>Ref: 8HWM-FF Attachment 1 Page 5, ¶4</p>	<p><u>Page 53, Paragraph 4:</u> The text states that in the event of the running 30-day average is exceeded where pond water levels cause concern for dam safety, procedures for pond discharge under dam safety conditions will be followed. The text should cite EG&G 1990e, "Plan for unplanned, releases and emergency discharges from Rocky Flats detention ponds." This document provides complete guidelines for this type of release.</p>	<p>This section (now Section 3.3.6) was rewritten in the revised Workplan, and reference to this draft plan does not occur. The Draft <i>Contingency Plan for Unplanned Releases and Emergency Discharges from Rocky Flats Plant Terminal Detention Ponds A-4, B-5, C-2</i>, is discussed in Section 3.1.3 of the revised Workplan.</p>
<p>Ref: 8HWM-FF Attachment 1 Page 5, ¶5</p>	<p><u>Page 54, Paragraph 1:</u> This paragraph indicates that quality control checks of analytical methods will continue on a routine basis. This section should be expanded to give more detail about the quality control procedures. In addition, RFP should consider including high precision mass spectrometry, as conducted by LANL, in the radionuclide analysis program.</p>	<p>Discussion of analytical QA/QA is provided in Section 4.3.9 and in Appendix III. The use of mass spectrometric measurements to improve analytical performance is under evaluation as described in Sections 3.4.2 and 4.4.2.</p>
<p>Ref: 8HWM-FF Attachment 1 Page 5, ¶6</p>	<p><u>Pages 54-56, Section 4.1.8:</u> This section contains four points on the pond water discharge plan including start up, analysis, and monitoring. However, it is not clear if discharge will be continuous or if discharge would cease when a pond returns to 10 percent capacity as stated in paragraph 2 of page 31. Also, it is not clear from this section if these are batch or continuous discharges as long as the pond stays above 20 percent capacity. It is not clear whether ponds are expected to remain above 20 percent capacity on a semi-continuous basis or if discharges due to overfull ponds will be the exception. Revise the text and expand this discussion to avoid confusion about the frequency of discharges.</p>	<p>A revised discussion of operational approaches and targets occurs in Section 3.3 of the revised Workplan. Sections 3.3.7 and 3.3.8, specifically discuss the pond volume maintenance criteria. The ponds may be discharged until the pond volume is at or below 10 percent, but they are not allowed to completely empty. When the ponds reach 20 percent they are evaluated by engineering best management practices for future potential discharge. A goal is to operate pond discharges as batch operations, without continual inflow. However, at times, such as spring runoff, this has not proven possible.</p>

Record of Response to Comments

Page 11 of 15

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: EPA, Region VIII

Date: 10/9/91

<p>Ref: 8HWM-FF Attachment 1 Page 5, ¶7</p>	<p><u>Page 57, Paragraph 1:</u> This paragraph discusses additional sampling for on-site and off-site areas to characterize the ambient concentrations of the radionuclides for which CWQCC has set stream standards. However, it does not state whether these sampling results will be used to determine the final ambient conditions discussed in paragraph 3 of page 18. This should be clarified in the text. The purpose of this work should be more clearly defined.</p>	<p>Two issues are involved and discussed in Section 4.2.2 of the revised Workplan: acquiring analytical data for sub-pCi/L level radionuclides (which will include Big Dry Creek Basin/Segment 5), and developing data set for non-routine analytes, e.g., Cm and Np. Analytical results will be used to evaluate ambient levels vs. water quality standards for Segment 5.</p>
<p>Ref: 8HWM-FF Attachment 1 Page 6, ¶2</p>	<p><u>Page 59, Section 4.3.1, Analytical Methods Proposed for Validation:</u> The methods listed for gross alpha, gross beta, tritium, uranium, cesium, radium, and strontium are specified in the Safe Drinking Water Act. EPA considers these methods to be validated. Regarding the methods proposed for plutonium, americium, curium, neptunium, and thorium, EPA Region VIII Radiation Programs is currently evaluating these methods and will make a determination on validation. DOE will be notified of this determination under separate cover.</p>	<p>RFP will continue to use the former methods, as required. RFP will continue to use proposed methods for the latter radionuclides, as required, while awaiting determinations on method validation.</p>
<p>Ref: 8HWM-FF Attachment 1 Page 6, ¶3</p>	<p><u>Page 62, Paragraph 3:</u> This paragraph discusses the characterization of the radionuclides from on-site and possible upstream sources in terms of solubility, complexation, and sorption properties. There is extensive literature on this topic which should be consulted. Additionally, the isotopic composition of uranium and plutonium could be used to trace possible off-site sources.</p>	<p>This section was rewritten to improve clarity of the revised Workplan (see Section 3.2). RFPs interest here is to provide treatment for 0.05 pCi/L Pu and Am. It is difficult and risky to extrapolate results of earlier studies involving higher radionuclide concentrations, since a highly variable chemical behavior is evident and source term may be an important factor determining properties and susceptibility to treatment. While a number of references on characterizing sub-pCi/L Pu exist in recent literature (e.g., Orlandini et al., <i>Environ. Sci. Technol.</i> 1990, 24, 706 and W.R. Penrose et al. <i>Environ. Sci. Technol.</i> 1990, 24, 228), no references to Pu/Am in the 0.05 pCi/L regime were uncovered (e.g., <i>Transuranic Elements in the Environment</i>, W.C. Hanson, Ed., DOE/TIC-22800, Technical Information Center/U.S. Department of Energy, April 1980).</p>

Record of Response to Comments

Page 12 of 15

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: EPA, Region VIII

Date: 10/9/91

Ref: 8HWM-FF Attachment 1 Page 6, ¶4	<u>Page A-2, Paragraph 1-4:</u> This section discusses the bedrock geology in the area of ponds A-3 and A-4. It raises the possibility that sandstone units within the Arapahoe Formation may be subcropping beneath the ponds and therefore contaminating pond water. This should be evaluated further. Because RFP waters have elevated tritium levels, this isotope could be used to trace pond-derived water into the underlying bedrock.	This is an interesting observation concerning sandstone, although RFP Environmental Monitoring Reports do not indicate elevated tritium levels that might be used to establish source terms.
Ref: 8WM-C Attachment 2 Page 1, Item 1	Executive Summary, 1st page, end of 2nd paragraph: The permit does not require a timely release of water from the ponds even though it may be desirable for purposes of retaining spill containment capacity.	It is true that the NPDES permit does not require a "timely" release of water, though that concept is listed as a best management practice. The use of the word "timely" was based on the American Heritage Dictionary definition: "occurring at a suitable or opportune time; well-timed".
Ref: 8WM-c Attachment 2 Page 1, Item 2	Executive Summary, 2nd page, 3rd paragraph: In line 7 recommend replacing "facilities" with "laboratories" or "labs". In line 9 recommend inserting "practical" or something similar before "detection". As discussed later in the report, it is possible to measure lower values, but it is a lot more time consuming and expensive.	This paragraph has been completely reworded to more clearly express the concept that available analytical methods cannot provide real-time monitoring of radionuclides at low environmental levels.
Ref: 8WM-C Attachment 2 Page 1, Item 3	Page 18, 1st paragraph, line 4: See comment No. 1.	This addresses the same locution concern as addressed previously.
Ref: 8WM-C Attachment 2 Page 1, Item 4	Page 19, last paragraph: although it is mentioned later in the report, should mention the current operational procedure of pumping from B-5 to A-4.	The current operational procedure of pumping water from B-5 to A-4 is now addressed in Section 3.3.2, Pre-Discharge Evaluation, of the revised Workplan.
Ref: 8WM-C Attachment 2 Page 1, Item 5	Page 20, last paragraph, 2nd line: The word "highest" seems somewhat inappropriate and recommend that it be either deleted and/or reworded.	Through inadvertent oversight this wording was not changed in the revised Workplan and correction will be made at the next opportunity.
Ref: 8WM-C Attachment 2 Page 2, Item 6	Page 22, 2nd paragraph, line 10: Insert "and Federal Facilities Compliance Agreement (FFCA)." after "permit".	Through inadvertent oversight this wording was not changed in the revised Workplan and correction will be made at the next opportunity.

Record of Response to Comments

Page 13 of 15

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: EPA, Region VIII

Date: 10/9/91

Ref: 8WM-C Attachment 2 Page 2, Item 7	Page 22, 3rd paragraph, line 4: Insert "less than" after "routinely to" so as to read "...drawn down routinely to less than the 10 percent pool level."	Through inadvertent oversight this wording was not changed in the revised Workplan and correction will be made at the next opportunity.
Ref: 8WM-C Attachment 2 Page 2, Item 8	Figure 3.2: In the right side of the flow chart it seems that a "No" is need below the diamond shaped "Discharge Required?".	The Pre-Discharge Evaluation Section 3.3.2 has been rewritten and the narrative expanded to include more details of the decision-making process. Figures 3.1 and 3.2 were eliminated.
Ref: 8WM-C Attachment 2 Page 2, Item 9	Page 32, bottom paragraph, lines 3-4: It is my understanding that the City of Broomfield controls the diversion of flow from Walnut Creek to the BDD. The wording in the sentence implies that the RFP voluntarily diverts the effluent to the BDD. Rewording is recommended.	Through inadvertent oversight this wording was not changed in the revised Workplan and correction will be made at the next opportunity.
Ref: 8WM-C Attachment 2 Page 2, Item 10	Page 33, top paragraph, line 4: It is my understanding that the BDD discharges into either Walnut Creek (downstream of Great Western Reservoir (GWR) or a ditch that flows into Walnut Creek. Further downstream Walnut Creek flows into Big Dry Creek.	Through inadvertent oversight this wording was not changed in the revised Workplan and correction will be made at the next opportunity.
Ref: 8WM-C Attachment 2 Page 2, Item (11)	Page 34, 2nd paragraph, 3.2.8, line 8: See comment No. 1.	See response for comment No. 1.
Ref: 8WM-C Attachment 2 Page 2, Item (12)	Page 34, 3rd paragraph, 3.2.9: The problem of scouring of sediments from the reservoir when discharging at low water levels could be corrected by making the appropriate modifications of the intake of the outlet works as was done on one of the three terminal ponds.	The intake modification was undertaken in 1984 for Pond B-5, and consisted of installing a raised concrete outlet structure. Unfortunately, although modifications of this sort would improve water management, such modifications on remaining ponds are complicated by the classification of ponds (sediments) as IHSSs, which prevents their disturbance outside the scope of a remedial action plan.
Ref: 8WM-C Attachment 2 Page 2, Item (13)	Page 37, top paragraph, line 10: Insert "be" before "consulted".	The statistical section has been rewritten, with the majority of the information now included as Appendix II Statistical Study of Radionuclide Levels.

Record of Response to Comments

Page 14 of 15

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: EPA, Region VIII

Date: 10/9/91

Ref: 8WM-C Attachment 2 Page 2, Item (14a)	Pages 43-47: For the removal of plutonium it seems that the studies should concentrate on methods that will produce a water that is extremely low in suspended and colloidal material.	Section 4.4 of the revised Workplan describes proposals to characterize radionuclide contaminants and focus on particulate removal primarily by physical entrapment and augmented by chemical means. These approaches do generally concentrate on methods to produce a water that is low in suspended and colloidal material.
Ref: 8WM-C Attachment 2 Page 3, Item (14b)	Because of the long turnaround times for radionuclide analyses, another method of day-to-day quality control is needed for discharges from the ponds.... It would be necessary to demonstrate a correlation between low plutonium concentrations and low turbidity levels in pond water that contains plutonium.	The revised Workplan (Section 4.3.8) supported by assessments in the <i>Background Geochemical Characterization Report</i>) offers a proposal to evaluate hypothesis that plutonium levels are correlated with particle/turbidity levels. RFP concurs that the search for indicator parameters to be used in real-time monitoring is important, because standard radionuclide analysis does require several days. Real-time particle counting might provide the desired monitoring capability.
Ref: 8WM-C Attachment 2 Page 3, Item (14c)	On page 44, 2nd paragraph, it mentions that conditioning would be followed carbon adsorption for removal of organic contaminants. With the proper management of herbicides and pesticides and the prevention of solvents reaching the terminal ponds in measurable concentrations, there is a good likelihood that the use of activated carbon will not be necessary.	Absence or presence of GAC (generally used to remove non-radionuclide contaminants) in the treatment train is generally outside the scope of this Workplan. Because of waste generation and operational costs, RFP anticipates maintaining operating treatment systems only when needed, and treatment will normally be provided in a standby mode. Because of the difficulty in providing real-time analysis for possible ppb-level organic contaminants, past regulatory concurrence typically listed operational GAC treatment.
Ref: 8WM-C Attachment 2 Page 3, Item (15)	Appendix II: I think there should be a brief description of the statistical methods used.	The revised Workplan cites analysis of variance and Duncan's multiple range test (see <i>Statistical Methods for Environmental Pollution Monitoring</i> by R.O. Gilbert) in comparing means of radionuclide levels from the six locations (Tables II-1 through II-6) mentioned in Appendix II. The comparisons in Tables II-7 through II-9 were performed by simply counting the number of values higher than 0.05 pCi/L.

Record of Response to Comments

Page 15 of 15

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: EPA, Region VIII

Date: 10/9/91

Ref: 8WM-C
Attachment 2
Page 3, Item (16)

In Tables II-7, II-8, and II-9, are the values for the listed cities for finished drinking water or what?

These are finished water samples taken from commercial taps at the water treatment plant for the identified public drinking water supply.

Record of Response to Comments

Page 1 of 28

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: Colorado Department of Health

Date: 10/9/91

Citation	Comment/Issue	Disposition
July 3, 1991 ltr RE: COMMENTS: DRAFT... Cvr ltr, ¶2, Item 1	The workplan must not be a forum for debating the virtue of discharge limits set by the Colorado Water Quality Control Commission (CWQCC). It is, however, the proper forum for demonstrating control procedures, analytical methods, and treatment technologies that will allow discharges in compliance with radionuclide levels established by CWQCC. References to Derived Concentration Guides (DCGs) are irrelevant in the context of this document. As DOE is aware, the CWQCC statewide and site specific standards for radionuclide levels in ground and surface waters are currently being re-evaluated; a Commission hearing on these standards is scheduled for February, 1992.	The September 16, 1991 ("revised") version of the Workplan was modified to improve clarity and include more substantive proposals for meeting CWQCC standards. The discussions of site-specific CWQCC stream standards was not to debate them, but to illustrate that the standards for radionuclides are unusually strict, and to express concern for the inadequacy of currently available analytical methodology and that comparatively high measurement uncertainty or analytical error may be misinterpreted as out-of-compliance with the standards.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Cvr ltr, ¶2, Item 2	The document, as written, may be better described as a report rather than as a plan-of-work. The approved document must adequately define the tasks and sequence of events Rocky Flats Plant will follow in controlling the release of water	In the revised Workplan Sections 1, 2, and 3 continue to serve as historical and descriptive narratives of the RFP from a water management perspective. However, Section 4 of this document was rewritten to emphasize and expand upon the actual plans and work proposals designed to improve the control of radionuclide levels in discharges of water from RFP. Section 4 has been organized to address the four elements specified in the IAG Statement of Work, Section XII.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Cvr ltr, ¶2, Item 3	Analytical methodologies and equipment must be upgraded to reliably establish radionuclide concentration levels, in compliance with CWQCC stream standards, whether water is released as treated or untreated effluent.	Section 4.3 of the revised Workplan was reworded to address improving analytical performance, methodologies and equipment. This section describes the limitations of current analytical methods and approaches to minimize or mitigate analytical uncertainty, and maximize and improve data utility.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Cvr ltr, ¶2, Item 4	The information on treatability studies needs to be expanded. Currently the documentation on the existing treatment system is inadequate. The "minimally effective" efficiency of the current system, reported in the workplan, must be supported.	The evolution of current treatment approach and current treatment configuration are discussed in an improved Section 3.4 of the revised Workplan. Section 4.4 was expanded to further elaborate RFP's proposed approach to evaluating water treatment methods.

Record of Response to Comments

Page 2 of 28

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: Colorado Department of Health

Date: 10/9/91

<p>July 3, 1991 ltr RE: COMMENTS: DRAFT... Cvr ltr, ¶2, Item 5</p>	<p>Concentrations of plutonium are statistically higher for Pond C-2 water and Pond C-2 betas are above standards for Woman Creek. Consequently, it is appropriate that DOE focus more on the Pond C-2 effluent and the treatment technologies applicable to these constituents.</p>	<p>Although the Pu levels for Pond C-2 appear statistically elevated compared to the other locations, Pond C-2 discharges meet the CWQCC standard. The significance of these comparisons may also be misleading due to: (1) high relative standard uncertainty in the measured values for Pu and Am at all locations, and (2) the comparatively low number of samples taken for Pond C-2 compared those taken from the other ponds and their seasonal collection frequency. (The majority of Pond C-2 samples were taken during the spring when elevated levels might be expected due to spring run-off.)</p> <p>Pond C-2 gross beta are required to meet the 5 pCi/L standard rather than 19 pCi/L value for the other terminal ponds. Gross beta values for Ponds C-2 and B-5 are distinguishable by statistical methods.</p> <p>Given these qualifications, RFP concurs on the focus and improvements for treating Pu and gross beta are proposed in Section 4.4 of the revised Workplan.</p>
<p>July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 1, pg 1, ¶1</p>	<p><u>Section 1.0</u>: In the 1st paragraph, page 1, reference is made to the " Work Statement, Attachment 1". The Statement of Work of the IAG is Attachment 2, Attachment 1 is a map of the IHSSs. Please amend this section to eliminate possible confusion for individuals less familiar with the agreement.</p>	<p>The first paragraph of the revised Workplan Introduction, Section 1.0, page 1-1, has been corrected to read "...Statement of Work (SOW), Attachment 2 to the IAG". Other sections of the revised Workplan were appropriately modified.</p>
<p>July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 1, pg. 1, ¶2</p>	<p>In the 2nd paragraph, page 1, reference is made to "Section XII of the IAG. Please revise text to indicate that Section XII is within the Statement of Work, Attachment 2, of the IAG. Again this will avoid confusion.</p>	<p>The second paragraph of the Introduction, Section 1.0, page 1-1, has been corrected to read "...Statement of Work/Attachment 2 to the IAG". Other sections of the revised Workplan were appropriately modified.</p>

Record of Response to Comments

Page 3 of 28

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: Colorado Department of Health

Date: 10/9/91

July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 1, pg. 1, ¶3	<u>Section 2.4.1:</u> In paragraph 1, page 9, the statement is made that the Rock Creek drainage is "generally unimpacted by plant operations or potential contaminant releases to surface water". The swirling and diurnal winds of the Rocky Flats site may have deposited contaminants onto the surface of this drainage; consequently, until scientific or statistical data are presented to the contrary, it is appropriate to address this as an issue within this workplan.	The reference to Rock Creek being "unimpacted" is irrelevant to the focus of the Workplan and was removed in the revised Workplan. As stated in the first sentence of the first paragraph of the Executive Summary, the purpose of this document is to address the control of radionuclides in water discharges from Rocky Flats holding/detention ponds in response to Section XII of the Statement of Work to the IAG. Since there are no RFP discharges to the Rock Creek drainage, the Workplan does not discuss the Rock Creek drainage.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 1, pg. 1, ¶4	In the last sentence, 2nd paragraph, page 11, please indicate the year as well as the month that the largest flow was observed.	The revised Workplan, Section 2.4.1, paragraph 4, was amended to cite the amount, date, and reference of the largest flow observed. This sentence now reads "To date, the largest flow observed at the outlet was 61 cfs in May 1973 (Hurr 1976)."
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 1, pg. 1, ¶5	<u>Section 2.4.2:</u> Please amend Figure 2.5 to show the routes of the Upper Church, McKay, Kinnear and Reservoir Co. ditches. The figure shows Church Ditch, does this differ from Upper Church Ditch?	Figure 2.5 has been enlarged to show the RFP surface water features in greater detail. The routes of Upper Church, McKay and Kinnear ditches are identified. The Reservoir Co. ditch is a small bypass located on the Kinnear ditch, and is not identified. The Upper Church Ditch originates from the Coal Creek watershed, while the Church Ditch originates from the Clear Creek watershed. The Church Ditch is located to the south of the RFP plantsite and so it is not identified on Figure 2.5.

Record of Response to Comments

Page 4 of 28

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: Colorado Department of Health

Date: 10/9/91

July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 1, pg. 1, ¶6	<u>Section 3.1.1</u> : Regarding the 1st bulleted item, page 20, how are pool elevations equivalent to a 10% capacity determined, is there a level marker? What effect does sediment volumes have on the ability of the terminal ponds to meet the 90% reserve holding capacity requirement of the NPDES permit? Will sediment be removed periodically, or on a scheduled basis, to maintain the 90% factor.	Pool elevations and capacities are determined from pond capacity curves (i.e., volume vs. pool elevation) generated from topographic surveys. Comparisons between the 1991 pond capacity curves and the 1980 pond capacity curves show less than a 5% difference, so sedimentation has been minor. Periodic sediment removal <i>as necessary to minimize scouring during release</i> of water from the terminal ponds is described in the Section A(6)(d) of the NPDES Permit; however, routine release of pond water no longer occurs through the outlet works and the removal of pond sediments is covered under the IAG.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 1, pg. 2, ¶1	<u>Section 3.1.2</u> : Paragraph 2, page 21, discusses the management practices and uses of ponds. A chart showing pond capacities, pond uses and decision criteria for water transfers etc. is needed to simplify this and similar discussions.	This section (now Section 3.3 of the revised Workplan, Pond Discharge Management) was rewritten to improve clarity and describes pond uses and criteria for water transfers and discharges in narrative form. A new study to update pond levels vs. volumes is nearing completion, and the revised Workplan does not yet include the requested table.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 1, pg. 2, ¶2	<u>Section 3.2.2</u> : Paragraph 2, page 26, refers to "substantiating the absence of contaminants" as a prerequisite for water release. Contaminants must be within CWQCC standards not totally absent.	While this Workplan specifically addresses radionuclide "contaminants," the same term also refers to non-radioactive compounds. For these contaminants without numeric standards ("Table 1" values), the CWQCC site-specific stream standards are zero as defined by the practical quantitation limit. Section 3.3, Pond Discharge Management, was rewritten to improve clarity.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 1, pg. 2, ¶3	<u>Section 3.2.6</u> : On page 33 it is stated that "EPA approval to convey the Pond C-2 (water) to BDD" has ended. Where will the C-2 water be directed now, or later, under the work plan?	Pond C-2 water will be piped, as required, to the centralized Pond A-4 Treatment Facility or to the BDD (with EPA approval). Also, a project to reuse Pond C-2 water in the raw water loop at RFP is currently under consideration with preliminary engineering designs already developed.

Record of Response to Comments

Page 5 of 28

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: Colorado Department of Health

Date: 10/9/91

<p>July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 1, pg. 2, ¶4</p>	<p><u>Section 3.2.7</u>: In the 2nd paragraph, page 33, the option of recirculating to the source pond is presently used. Please clarify that the proposed option is also the current option.</p>	<p>This section (now Section 3.3.6 in the revised Workplan) occurring under the current practices section entitled, Pond Discharge Management, was rewritten to improve clarity. The topic of continuing pond treatment on a recirculating basis is now addressed in the workplan proposals Section 4.1.6.3, Representative Sampling.</p>
<p>July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 1, pg. 2, ¶5</p>	<p><u>Section 3.4.1</u>: The bulleted items on page 44 make reference to a filter press. Where, and how, are treatment wastes or residues disposed?</p>	<p>RFP anticipates that the filtration residues will be treated in a way analogous to those from the STP; however, residue management will be governed by the characterization of the waste. The particular treatment, storage, and disposal method would be controlled by the "Hazardous Waste Requirements Manual" (EG&G, 1991), Waste Operations "Waste Management Manual," RFP MAT 19-004 "Management of Nonradioactive Hazardous and Toxic Waste Materials," and H&S 21.01 "Waste Processing" (EG&G, 1991m). These documents implement regulations and orders of the EPA, CDH, the DOE, and other agencies having jurisdiction at RFP.</p>

Record of Response to Comments

Page 6 of 28

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: Colorado Department of Health

Date: 10/9/91

<p>July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 1, pg. 2, ¶6</p>	<p><u>Section 3.4.2:</u> Item 2, page 45, discusses a significant reduction of plutonium and americium levels. Please provide quantitative versus subjective descriptions of the reduction.</p>	<p>The reduction in plutonium and americium levels from filtration, as described in the draft, should be considered preliminary results. The rationale for using filtration is described in Sections 3.4.1 (Evolution of Current Treatment) and 3.4.2 (Current Treatment Method Development), while future filtration proposals are detailed in Section 4.4.1, Improving Current Treatment. These evaluations were conducted in February 1990 and pre-date the IAG. Filter evaluations were conducted using nominally rated filter bags, and solely to provide immediate answers to the requirement for immediate release pond water in compliance with the promulgated CWQCC standards. Evaluations were conducted on a fast turnaround to evaluate immediately available methods to remove particulates (and potentially, radionuclides) from pond water prior to its imminent discharge. Time frame of the required action allowed only gross alpha and gross beta parameters to be evaluated <i>before</i> full-scale treatment was put in place.</p> <p><i>Initial</i> indications showed diminished gross alpha levels following filtering, but subsequent routine screening and radionuclide specific analyses failed to substantiate these earlier results. This section was rewritten in the revised Workplan to improve clarity.</p>
<p>July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 1, pg. 2, ¶7</p>	<p><u>Section 4.1.3:</u> Does the model, scheduled for completion in the 2nd quarter 1992, account for sediment infilling of the ponds and subsequent impacts on pond capacities? The 90% reserve holding capacity of the terminal ponds, in respect to actual determinations of the 20% action level could be seriously affected by sediment infilling.</p>	<p>Pool elevations and capacities are determined from pond capacity curves which have been generated from topographic surveys. Comparisons between the 1991 pond capacity curves and the 1980 pond capacity curves show less than a 5% difference, so sedimentation has been minor. Sediment removal to maintain pond capacity is not anticipated at this time.</p>

Record of Response to Comments

Page 7 of 28

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: Colorado Department of Health

Date: 10/9/91

July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 1, pg. 2, ¶8	<u>Section 4.1.5:</u> In paragraph 1, page 50, it states that RFP will develop a sampling program. The sampling program must be incorporated into the workplan as a SOP to direct current and future sampling personnel. If adequate and appropriate the sitewide SOPs may be referenced; a SOPA (SOP Addendum) may be necessary. A sampling program cannot be an objective of the workplan but a component of the plan.	Sampling Methods are discussed in Section 3.2.2 of the revised Workplan and relevant sampling protocols and standard operating procedures (SOPs) are referenced in Appendix IV, Quality Assurance Addendum to the Rocky Flats Plant Quality Assurance Project Plan.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 1, pg. 2, ¶9	In paragraph 2, page 50, it is stated that "Each composite sample will be collected in sufficient volume...". Sample volumes must be addressed within a SOP as discussed above.	Sample volumes are now addressed in the Appendix IV, Quality Assurance Addendum to the Rocky Flats Plant Quality Assurance Project Plan: Identification and Control of Items, Samples, and Data (Section 8.0) of the revised Workplan. A proposal to utilize larger sample volumes is discussed in Section 4.3.4, Improving Analytical Methods/Performance.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 1, pg. 2, ¶10	<u>Section 4.1.6:</u> Please explain specifically how "running 30-day average(s)" are calculated. (Explain, to the benefit of the public, that 30 consecutive days of data are not required.)	The 30-day average was adopted to accommodate the limitations of availability of analytical capacity, uncertainties, and turnaround time which preclude real-time analysis. Sections 3.2.3 and 4.2.3, and Appendix II of the revised Workplan discuss the 30-day moving (i.e., running) average. Included in Section 4.1.7.

Record of Response to Comments

Page 8 of 28

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: Colorado Department of Health

Date: 10/9/91

<p>July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 1, pg. 2, ¶11</p>	<p><u>Section 4.1.8:</u> Under the Pond Water Discharge Plan, Item 3, please clarify the following procedure. Will water discharges exceeding a standard be routed to treatment for continued discharge or will all discharge be halted immediately?</p>	<p>This situation poses an interesting dilemma since results of routine analyses of discharged water for Pu and Am are received at least 2 weeks <i>following</i> the release of the water, i.e., results are for water already released two weeks earlier. This is an unavoidable result of analytical turnaround times for Pu and Am. Chances of high contaminant levels are diminished by routine analyses of water prior to the final detention ponds. Discharges from the terminal ponds are conducted in a batchwise fashion occurring every 6 weeks and lasting for 2 to 3 weeks.</p> <p>Potential radionuclide levels above CWQCC standards following treatment will require re-evaluation and refinement of treatment measures. Proposals to improve treatment are described in Section 4.4 of the revised Workplan. Sections 3.3.5 (Current Discharge Mode), 4.1 (Workplan Element #1: Control of Release of Radionuclides), and 4.2 (Workplan Element #2: Assessment of Water Quality) discuss water discharge criteria in detail.</p>
<p>July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 1, pg. 3, ¶1</p>	<p><u>Section 4.2.2:</u> The methods, page 57, for sampling of pond and discharge waters must be a section in this workplan, not an objective of the plan. These methods will be subject to review and approval.</p>	<p>Discussions of sampling were expanded and are discussed in Sections 3.2.2 and 4.1.6, and Appendix IV (Quality Assurance Addendum to the Rocky Flats Plant Quality Assurance Project Plan) of the revised Workplan. SOPs for a variety of environmental monitoring activities are due for release as controlled documents in October 1991.</p>
<p>July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 1, pg. 3, ¶2</p>	<p><u>Section 4.4:</u> Treatment options, page 61, will have to be incorporated into the plan as developed.</p>	<p>The plan for developing treatment options is expanded and presented in Section 4.4 of the revised Workplan.</p>

Record of Response to Comments

Page 9 of 28

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: Colorado Department of Health

Date: 10/9/91

July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 1, ¶1	The purpose of this workplan is to identify how DOE will meet the streams standards for radionuclides and specifically what technology will be available for use at the ponds should the water exceed the standards. Additionally DOE should recognize that significant characterization work (for example: contaminant speciation, effects of storm events on contaminant transport, etc.) still needs to be performed and should be integrated with this plan.	Section 4.4 of the revised Workplan discusses treatability evaluations and the characterization of radionuclides. Speciation and quantitation of radiochemical species, as well as the radiochemical source identification and control, including contaminant transport are included. Additional work is underway to evaluate the effects of storm events and collect data for the upcoming stormwater permit.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 1, ¶2	The document should layout specific tasks and provide more detail about each task. Particularly with respect to the treatability studies it provides only general information on the intended work and should include more detail about the methods of reviewing and selecting potential treatment technologies, unit operations and control parameters, performance data, schedules and timeframes, waste generation and handling issues, etc.	More detailed information and proposals are included in the plan of work, Section 4, of the revised Workplan. This includes greater specificity on proposed treatment methods and development schedules (Section 4.4). Since neither "proof of principle" nor feasibility of methods/unit operations for removal of sub-pCi/L level radionuclides are yet demonstrated, detailed design calculations are unavailable.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 1, ¶3	The document includes considerable discussion on DCGs versus the stream standards. This is inappropriate since the plan is to address the existing standards and should not be used as a forum for debating standards. DOE is aware that the site-specific and Basic standards for ground water and surface water radionuclides are currently under review and there is a hearing scheduled for next February on these standards.	Reference to DCGs and appropriateness of the CWQCC standards were deleted from the revised Workplan. The intent was not to criticize the standards, but merely to illustrate that the CWQCC site specific standards for radionuclide levels are strict, and to express the concern that the comparatively high level of measurement uncertainty or analytical error may be misinterpreted as out-of-compliance with the standards.

Record of Response to Comments

Page 10 of 28

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: Colorado Department of Health

Date: 10/9/91

July 3, 1991 ltr
RE: COMMENTS: DRAFT...
Review 2, pg. 1, ¶4

There are numerous references to the terminal ponds treatment system that may be misleading. The purpose of the GAC for removal of organic contaminants (mainly atrazine) should be clearly specified. DOE should also make it clear that, although they anticipated that the pre-filtration before the GAC system would remove radionuclides, that, in fact, the treatment system had little affect on radionuclide concentrations. It also should provide the data, and analysis of that data, which led them to that conclusion.

RFP concurs that the purpose of the GAC was to remove organic contaminants and not radiochemistry. Filtration was examined and implemented to protect the GAC and remove radionuclides without the addition of chemical agents. Unfortunately, the quality of historical analytical data do not afford the opportunity to say whether or not filtration is effective. Close examination of uncertainties in the analytical measurements makes comparisons of pre- and post-treatment Pu and Am levels difficult using current analytical methods, i.e., the results are indistinguishable. Appendix II of the revised Workplan shows standard deviations *equal to or greater* than the measured Pu and Am values.

The rationale for using filtration is described in Sections 3.4.1 (Evolution of Current Treatment) and 3.4.2 (Current Treatment Method Development). Section 3.4.3 (Current Treatment) describes the anticipated versus actual reductions in gross alpha and gross beta levels.

Record of Response to Comments

Page 11 of 28

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: Colorado Department of Health

Date: 10/9/91

<p>July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 2, ¶1</p>	<p>Since concentrations of plutonium are statistically higher for pond C2 water and since C2 pond beta values are above the standards for Woman Creek, it would be appropriate for DOE to focus more on the C2 effluent and the treatment technologies appropriate for these constituents. This would be particularly important should an emergency discharge to Woman Creek become necessary at some point.</p>	<p>Although the Pu levels for Pond C-2 appear statistically elevated compared to the other locations, Pond C-2 discharges meet the CWQCC standard. The significance of these comparisons may also be misleading due to: (1) high relative standard uncertainty in the measured values for Pu and Am at all locations, and (2) the comparatively low number of samples taken for Pond C-2 compared those taken from the other ponds and their seasonal collection frequency. (The majority of Pond C-2 samples were taken during the spring when elevated levels might be expected due to spring run-off.)</p> <p>Pond C-2 gross beta are required to meet the 5 pCi/L standard rather than 19 pCi/L value for the other terminal ponds. Gross beta values for Ponds C-2 and B-5 are distinguishable by statistical methods.</p> <p>Given these qualifications, RFP concurs on the focus and improvements for treating Pu and gross beta are proposed in Section 4.4 of the revised Workplan.</p>
<p>July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 2, ¶2</p>	<p>The workplan should acknowledge development of new analytical methods, explain how DOE will evaluate new methods for use at the plant site and provide for submitting new laboratory protocols for review.</p>	<p>Section 4.3 (Workplan Element #3: Analytical Methods Analytical Methods) of the revised Workplan was rewritten and proposes analytical improvements and new methodologies to be considered.</p>
<p>July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 2, ¶3</p>	<p>The workplan should present separately a schedule to integrate basin-wide issues involving the cities project, CERCLA, surface and subsurface water management plans and stream standards in one or more subsequent workplans to insure compliance with the broader framework of compliance with the stream standards. The document should develop a control strategy for contaminant release for each basin, temporally and spatially. References to other approved documents or those under review should be acceptable.</p>	<p>This Workplan is prepared in response to Section XII of the Statement of Work to the IAG and the four work elements identified therein. Accordingly, it addresses the current conditions and provides a future Workplan for the control of radionuclide levels in water discharges from terminal ponds. A "Surface Water Management Plan" is in preparation and presently in final draft form. While integration of the various water management plans and options, IAG activities, and AIP studies is appropriate RFP does not believe this Workplan is the proper vehicle for that task.</p>

Record of Response to Comments

Page 12 of 28

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: Colorado Department of Health

Date: 10/9/91

July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 2, ¶4	<u>Appendix Figures</u> : On page iv, Figures II—4a an II-4b should be changed to read Gross Alpha Level Histogram.	All Appendix II Figures II-1 through II-5 are frequency distributions or histograms. Figure labels refer to them as "Average 'Analyte' Concentrations."
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 2, ¶5	<u>List of Acronyms and Abbreviations</u> : Is the inclusion of DAF correct?	DAF is an acronym for Dissolved Air Flotation.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 2, ¶6	<u>Executive Summary</u> : In the last page of the executive summary the "third consequence of analytical and statistical shortcoming" is discussed. What are the first and second shortcomings, the numbered items, of the preceding paragraph, don't seem to quite fit the wordings of this subject. (shortcomings) If they are identified they need to be clearly noted.	The Executive Summary was rewritten to improve clarity of the revised Workplan; the use of the term "third shortcoming" is no longer used.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 2, ¶7	<u>Section 2.4.1</u> : On page 11, the discussion concerning Walnut Creek is somewhat misleading. The natural flow of Walnut Creek would be through Great Western Res., however Broomfield built a diversion ditch which has been used to bypass the Reservoir when water is being released from the plant site.	The last paragraph of Section 2.4.1 (Natural Drainages) describes the Walnut Creek drainage basin, the natural flow of Walnut Creek to Great Western Reservoir, and the Broomfield Diversion Ditch (BDD). The purpose of the BDD is to divert normal Walnut Creek flows around GWR when RFP pond water is being released to Walnut Creek.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 2, ¶8	<u>Figure 2.6</u> : The schematic needs to be updated to include the B5 to A4 transfer line, as well as the C2 to Broomfield diversion ditch line and the plans for C2 to B5 and C2 to process recycle lines.	Existing conveyances were updated in Figure 2.6 for the revised Workplan.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 2, ¶9	<u>Section 2.5.2</u> : Although it is true that the WQCC's action in establishing the new standards for radionuclides was not part of a national change in regulations, the Commission felt that is was appropriate to adopt these standards at Rocky Flats as these contaminants are present at the plant, there are no national standards for plutonium and americium, and there are two public water supply reservoirs downstream of the plant site. See general comment above concerning debating standards.	The intent was not to contend the CWQCC site-specific stream standards, but to illustrate that the standards for radionuclide levels are unusually strict, and to express the concern that the comparatively high level of measurement uncertainty or analytical error may result in or be misinterpreted as out-of-compliance condition.

Record of Response to Comments

Page 13 of 28

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: Colorado Department of Health

Date: 10/9/91

July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 3, ¶2	<u>Section 2.5.4</u> : DOE should be performing the monitoring in Segment 5 that they have discussed here.	RFP monitors the raw water supply and at onsite Segment 5 locations to better define radionuclide levels for the CWQCC standards-setting hearing scheduled for 1992.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 3, ¶3	<u>Section 3.1</u> : DOE should be "exploring in depth" the implications of zero discharge on the downstream water rights as one of the vital initial steps in the zero discharge study required in the AIP.	Zero discharge (ZD) options have been evaluated over the last two decades, and are most recently being studied under the direction of the AIP. Specific impacts of the various zero discharge options are being evaluated and include: (1) lack of water rights for DOE/RFP, (2) effects of full consumptive use of all wastewater and return flows on downstream users and various riparian habitats, and (3) changes in waste loading to the South Platte as a result of ZD. A final draft of the last in a series of studies: "Consolidation and Zero-Discharge Plan, Rocky Flats Plant," Task 30, was completed June 25, 1991. Surface water management options are affected by the Congressional initiative/Skaggs committee process, which selected "Option B/J." Option B/J includes control and storage of surface water flows from RFP, among other actions, and its impacts are under study.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 3, ¶4	<u>Section 3.1.1</u> : In the second paragraph, page 21, reference is made to a draft Contingency Plan. A final Contingency Plan should be referenced here even if not yet finalized.	This section was rewritten for the revised Workplan; however, the final Contingency Plan is in preparation and a final title for the document is not available.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 3, ¶5	<u>Section 3.1.2</u> : On page 22, although the treatment system was "designed" for radionuclide removal the system did not function that way.	Unfortunately, the quality of Pu and Am analytical data (limited by a historical MDA of 0.08 pCi/L) does not allow accurate determination of true levels nor the quantitation of any removal, i.e., uncertainties in analytical data preclude distinguishing untreated and treated water. This section was reworded in the revised Workplan.

Record of Response to Comments

Page 14 of 28

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: Colorado Department of Health

Date: 10/9/91

July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 3, ¶6	<u>Table 3.1</u> : The table, page 29, includes a rounding error for plutonium. See table on previous page.	The MDA for Pu-239,-240 varies from year to year. The 1989 RFP Annual Environmental Monitoring Report gave 0.01 pCi/L and the 1990 Annual Report gives 0.02 pCi/L. The RFP H&S Laboratory reported (March 1991) an actual MDA for Pu of 0.016 pCi/L for a 5-liter sample. The MDAs for Pu and Am will be corrected in the final Workplan to reflect the latest information.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 3, ¶7	<u>Section 3.2.4</u> : In the last paragraph, page 31, reference is made to "three independent parties". Please identify the three parties by name. The cities have cut back their sampling efforts because of cost.	This section was reworded to improve clarity are incorporated in the revised Workplan. Three laboratories—RFP H&S Lab, a sub-contracted lab, and CDH—analyze for radionuclides. Contracted laboratory services conform to the RFP/EM's GRRASP protocol. GRRASP details the RFP requirements that analytical laboratory subcontractors must meet for sample analysis, deliverables, and documentation.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 3, ¶8	<u>Section 3.2.6</u> : The water, page 32, did not initially meet the standard for atrazine, although it does routinely meet the standards now. Water from C2 is not presently being treated.	This paragraph was corrected to clarify treatment of pond water during discharge.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 3, ¶9	<u>Section 3.3.2</u> : There are other interpretations to item 1, page 35, if one looks objectively at the data. (Contact Jeb Love, CDH, RFPU)	This section was rewritten to reflect a conservative interpretation of available data. There are other data interpretations. Unfortunately, the quality of Pu and Am analytical data (limited by a historical MDA of 0.08 pCi/L) does not allow accurate determination of true levels nor the quantitation of any removal.

Record of Response to Comments

Page 15 of 28

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: Colorado Department of Health

Date: 10/9/91

July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 3, ¶10	The selected results tabulation, pages 35 and 36, does not relate to a timeframe (none identified). Older data is higher because less control exerted historically.	Comparison Tables were "selected" in the sense that gross alpha and beta were included only in Appendix II. The timeframe, sources, and statistical methods are identified both on the previous page of the Workplan and in Appendix II. RFP believes differences between past and present data quality are due to improvements in sampling and analytical methods. RFP does not consider the data quality (see above) to be adequate for detailed comparisons among locations. The statistical assessment section was rewritten to improve clarity.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 3, ¶11	Regarding the comparison review, page 37, please contact Jeb Love regarding the type of comparison review done by CDH and EPA which shows different results. Timeframe is important as Cotter Corporation's Schwartzwalder Mine used to discharge high concentrations of uranium into Ralston Creek which then flowed into Ralston Reservoir and was subsequently pumped to RFP. This was detected (at lower levels) in the RFP discharge (where impacted by Cotter).	RFP would be interested in obtaining copies of the CDH/EPA data assessment. This section was rewritten in the revised Workplan.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 3, ¶12	<u>Tables 3.2, 3.3 & 3.4</u> : The tables, page 36, should include one for gross beta and the text should discuss it.	The statistical assessment section was rewritten to compare analyte levels where data quality was appropriate; complete assessments are provided in Appendix II. The draft Workplan, Appendix II (Statistical Study of Radionuclides) includes a comparison of the indicator parameters, gross alpha and gross beta, among the various locations.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 4, ¶1	<u>Section 3.3.3</u> : The water from C2, page 41, does not routinely meet the Woman Creek standard for beta.	This document was corrected to note the gross beta levels at Pond C-2. Interestingly, the gross beta has seldom, if ever, met the CWQCC standard of 5 pCi/L.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 4, ¶2	In the first two paragraphs of page 42, the running thirty day average rather than a single value is normally used in evaluating compliance with these standards. The statement concerning applying the standards to other waters is irrelevant.	These paragraphs were rewritten to more clearly explain the importance of comparing analytical results with caution, particularly when the numbers are close to zero, the relative uncertainty is comparatively high, and the results are less than the established MDA.

Record of Response to Comments

Page 16 of 28

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: Colorado Department of Health

Date: 10/9/91

July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 4, ¶3	<u>Section 3.3.3</u> : The Table 3.7 Americium values for Arvada, Denver, and Thornton demonstrate the questionable validity of the RFP analysis. No other source of americium but RFP.	This data was included to show the limitations of the available analytical methods/results for Pu and Am, and that caution should be used with analytical results close to zero.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 4, ¶4	<u>Section 3.4.1</u> : This section, pages 42-44, is on Current Treatment, but study topics are inappropriately included, they belong to Section 3.4.2 or 4.4.3.	Section 3.4 was rewritten. The results from preliminary studies conducted in 1990 were presented in Section 3.4 (Current Treatment) of the revised Workplan because an understanding of these results is necessary to evaluate the current system configuration and logically present the proposed treatment options. The proposed treatment studies/options are discussed in greater detail in Section 4.4 (Workplan Element #4: Treatment Evaluations and Proposals).
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 4, ¶5	We would like to have a copy of the specific study referred to on page 43.	A final document is available for this study will be sent under separate cover.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 4, ¶6	<u>Section 4.1.2</u> : The emergency response exercise in 1989 was canceled due to concern for the fullness of Pond C-2 and the fact that the dam moisture saturation was unknown (no piezometer). The recommendations of the DOE Environmental Tiger Team was that a piezometer be installed. This plan needs to address the recommendation. Please check the recommendation section of the Tiger Team report to see if there are other items that should be addressed.	The placement of piezometers at Pond C-2 is not listed as part of the DOE Environmental Tiger Team findings; however, two piezometers were installed on the C-2 dam, one at the crest and one at the toe.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 4, ¶7	<u>Section 4.1.4</u> : How will the valving on the C2 to BDD/B5 be configured to make sure that no inadvertent transfers take place. Will it be obvious to the valve operator that the water is going to the location requested?	The valving on the C-2 to BDD/B-5 transfer line is a combination of a locked T-connection and removable section enroute to the BDD.

Record of Response to Comments

Page 17 of 28

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: Colorado Department of Health

Date: 10/9/91

July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 4, ¶8	<u>Section 4.1.6:</u> If the running 30-day average, page 51, exceeds the WQCC standards for the receiving body of water, the transfer should be terminated until additional appropriate treatment is initiated and/or the water is confirmed as meeting the standard.	CDH continues to review and provide concurrence to RFP for resumption of pond discharge, and to request further information and/or corrective actions on the part of RFP, as required. Resumption of any discharge by RFP would be expected to receive concurrence from CDH and occur at such time as the running 30-day average radiochemical parameters return to levels at or below those of the CWQCC standards. Clearly, improvements in accuracy and turnaround time are required for demonstrating timely compliance. Plans to improve analytical performance are discussed in Section 4.3 of the revised Workplan.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 4, ¶9	The last sentence of the first paragraph, page 53, is unclear. DOE is responsible for notifying CDH, EPA and the local municipalities of the resumption of discharge.	RFP is used to refer to the Rocky Flats Plant, not specifying either DOE or EG&G. While DOE is responsible for notifying CDH, EPA, and the local municipalities of the resumption of discharge, that responsibility may be assigned to EG&G by DOE.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 4, ¶10	<u>Section 4.2.2:</u> Regarding sampling methods, page 57, for water to be discharged unfiltered; don't take filtered samples to evaluate discharge. Take the sample from the treatment/non-treatment circumstance but it must be representative of what is to be discharged or the sample/data are invalid.	The intent of this section of the draft Workplan was to explore sources of variability in analytical data, not to determine representativity or evaluate suitability for discharge. Any discharges will be sampled from the same treatment/non-treatment circumstance. This section was rewritten for the revised Workplan.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 4, ¶11	<u>Section 4.4.1:</u> Regarding the first paragraph, page 63, storm event sampling should also be used for supporting data on erosional transport.	Section 4.4.2 of the revised Workplan describes the data sources which will be used to determine transport mechanisms. Agricultural runoff/erosion models will be used to provide estimates of the frequency, timing, and magnitude of runoff and erosion events and the associated contaminant transport.

Record of Response to Comments

Page 18 of 28

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: Colorado Department of Health

Date: 10/9/91

July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 5, ¶1	<u>Section 4.3.2:</u> Regarding the use of indicator parameters, page 61, some of the parameters have <u>no</u> relationship with others. Alpha cannot be used for plutonium because plutonium standards are well below Alpha detection levels. Also, pH and other similar parameters may not be <u>directly</u> related to plutonium or americium. Please fully document the value and effectiveness of any indicator parameters proposed for real-time analysis.	RFP agrees that gross alpha cannot be used as an indicator of compliance with Pu and Am standards. As a hypothesis, several easily identified parameters, including TSS and particle counts, are proposed as indicators of contaminants. The section offers a proposal or hypothesis and the results of some preliminary tests, but is not a summary of final test results. Establishing indicator parameters that may be used for real-time monitoring is important because standard radionuclide analysis requires many days.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 5, ¶2	<u>Section 4.4.2:</u> Regarding the last two bulleted items on page 63, where will the results of these last two evaluations be reported?	This section was expanded in the revised Workplan. The results will be reported informally at monthly meetings with CDH and local municipalities and in the annual report described in Section 4.4.4 (Annual Report and Recommendations for Further Work) of the revised Workplan.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 5, ¶3	<u>Section 4.4.3:</u> How will the TSP work described on page 64 be integrated with the work described on pg. 44?	Treatment method evaluation is fully integrated in the approach described in the revised Workplan. The integration of treatability studies with current water treatment is explained in the Workplan Section 4.4.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 5, ¶4	<u>References:</u> The references, page 66, do not include the Tiger Team Report on their DOE "action to be taken" Report. The Tiger Team Report recommended actions that should be addressed by the workplan.	The Tiger Team Report findings and recommendations applicable to this Workplan were incorporated into several action plans outside the scope of the IAG.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 5, ¶5	<u>Figure II—5b:</u> Include figure for gross beta for Woman Creek.	This information is provided by Pond C-1 data which is collected from the flow-through pond on Woman Creek.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 5, ¶6	<u>On page A-24, third paragraph,</u> the standards are applied using the running 30 day average value. Single exceedences of the standard, as long as they are not exceedingly high values, would not cause "exceedence of the standards on a regular basis."	The 30-day moving average section was expanded to more clearly provide a definition of what this term means and how it is used. The new explanation is found in Section 4.2.3 (30-Day Moving Average) of the revised Workplan.

Record of Response to Comments

Page 19 of 28

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: Colorado Department of Health

Date: 10/9/91

July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 5, ¶7	<u>On page A-24, the fourth paragraph</u> is unclear.	This paragraph was rewritten to more clearly explain the importance of comparing analytical results with caution, particularly when the numbers are near zero, the relative uncertainty is comparatively high, and the results are less than the established MDA. These data were included to show the caution that should be used with analytical results of numbers near detection.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 2, pg. 5, ¶8	Please provide copies of those treatability studies which are complete including the data and analysis of the effectiveness of the "existing treatment system" for radionuclide removal. Please provide the workplans for those treatability studies which are still in process.	Treatment evaluations and plans were developed, and are underway or being developed to improve current treatment. Since these were initiated prior to and outside the scope of this Workplan, no formal workplans are available. Applicable final results of ongoing and near-term studies will be provided as available. The sitewide Treatability Study Plan is available under separate cover.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 3, pg. 1, ¶1	I. Conclusion and recommendations. ...The larger filter blocks that have already been installed may be expected to prevent actinide concentrations from exceeding Colorado Water Quality Control Commission standards without further modifications to treatment procedures; the workplan should provide documentation of the resulting actinide levels.	Preliminary information on removal of actinides by sub-micron filtration indicates probable success, but unfortunately, available analytical methods/data cannot support the effectiveness of current treatment. Revised Workplan Section 3.4.2.1 (Filter Bag Evaluations) summarizes the limitations of the test results.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 3, pg. 1, ¶2	Our understanding of the radiometric analysis procedures in use at the Rocky Flats Plant suggest some technological improvement could be implemented that would improve the sensitivity and precision of measurements.	Section 4.3.4 (Improving Analytical Methods/-Performance) of the revised Workplan addresses the issue of improving analytical performance through technological improvements.

Record of Response to Comments

Page 20 of 28

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: Colorado Department of Health

Date: 10/9/91

<p>July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 3, pg. 2, ¶3</p>	<p>Rapid analysis of radionuclides at the targeted concentrations is not feasible, so it may be constructive to allow discharge before the radiometric measurements are completed, recognizing that the subject facility is responsible for compliance in any case. It may even be appropriate to develop a sampling plan, such as one using a continuous sampler, that would evaluate continuous treatment and discharge, as an alternative to the present sampling plan that treats each discharge as an isolated event.</p>	<p>Potential contaminant levels above CWQCC standards following treatment would require re-evaluation and refinement of treatment measures before discharge is resumed. Continuous treatment would appear undesirable from a waste generation and cost standpoint especially if improved analytical methods would show untreated water met standards. Sections 3.3.5 (Current Discharge Mode), 4.1 (Workplan Element #1: Control of Release of Radionuclides), and 4.2 (Workplan Element #2: Assessment of Water Quality) discuss water discharge criteria in detail. Section 4.3.8 Proposed Real-Time Monitoring Methodology addresses the second comment.</p>
<p>July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 3, pg. 2, ¶4</p>	<p>Notwithstanding the Running 30-day Averaging method, DOE should continue to seek new approaches or devise new methods to address the issues discussed in the preceding two paragraphs.</p>	<p>Several easily identified parameters, including TSS and particle counts, were identified for potential use as near real-time indicators of contaminants. The search for indicator parameters for real-time monitoring is important since standard radionuclide analysis requires many days. Approaches to improving analytical performance are described in Section 4.3 of the revised Workplan.</p>
<p>July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 3, pg. 2, ¶5</p>	<p>The discussion of Derived Concentration Guides (DCGs) in Section 3.3.4 (p 41) requires some modification for accuracy...By implementation of the Water Quality Control Commission's standards, which target concentrations far below the DCGs, a standard for protection considerably more stringent than 100 mrem/yr has been functionally adopted. Under the circumstance, we do not see what place, if any a discussion of DCGs has in the workplan.</p>	<p>Discussion of DCGs was removed from the revised Workplan. The intent was to compare the CWQCC site-specific standards for radionuclides with another guideline, and to indicate that the standards are unusually strict, and to express the concern that the comparatively high level of measurement uncertainty may result in an inappropriate out-of-compliance assessment.</p>

Record of Response to Comments

Page 21 of 28

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: Colorado Department of Health

Date: 10/9/91

July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 3, pg. 3, ¶5	Radiation Control Division is unclear on how sampling will be conducted for calculating 30-day moving averages or how they will be used for evaluation. Please provide clarification of the procedures.	The 30-day moving average section has been expanded in the revised Workplan to more clearly define this term and how it is applied. The expanded discussions occur in Section 4.2.3.1 (30-Day Moving Average) and in Appendix II.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 3, pg. 3, ¶7	The formula for minimum detectable activity (MDA) in Section 3.2.4 Reporting Practices for Radiochemical Data (p. 27) is in error....Because the workplan describes the terms, formulas and procedures employed at the Rocky Flats Plant, the information in the workplan should be reconciled...	The revised Workplan section including the formula for MDA was rewritten and reconciled with that used by EPA and elaborates approaches used specifically at RFP.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 3, pg.45, ¶4	It is suggested in Section 3.2.4 Reporting Practices for Radiochemical Data (p. 28) that it is advantageous to report all measurements, whether or not they fall below the LLD (or MDA), with an attempt to justify this point of view. The Radiation Control Division will not endorse such a statement and we hope that it will be modified in some way so that it will not be interpreted as a universally accepted opinion.	These paragraphs have been rewritten to more clearly explain RFP-specific data reporting and the importance of comparing analytical results with caution, particularly when the numbers are close to zero, the degree of uncertainty is comparatively high, and the results are less than the established MDA. Reporting is in accordance with EPA 520/1-80-012. The revised Workplan also recommends meetings between RFP and CDH to resolve differences in analytical methods and approaches to data reporting and assessment.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 3, pg. 4, ¶5	We disagree with the statement in Section 4.1.7 (p. 54), "The reported MDA should be interpreted as that of the process and not that of a single measurement..." The Colorado Department of Health's approach to environmental actinide analysis is not process-oriented. Instead we are highly opportunistic in short-run uses of extended sample volumes and measurement times, particularly when chemical recovered are high enough to warrant expenditure of resources to improve sensitivity.	The revised Workplan section on MDA (Section 3.2.2) was rewritten to clarify the RFP approach to MDA. Until the RFP can improve analytical methodology (Workplan Section 4.3, Analytical Methods, describes proposed analytical improvements), averaging will be required since random variability will likely give rise to single exceedences due to analytical uncertainty/error alone, i.e., a false positive is likely. The 30-day average minimizes the uncertainty in measurement. The revised Workplan also recommends meetings between RFP and CDH to resolve differences in analytical methods and approaches to data reporting and assessment.

Record of Response to Comments

Page 22 of 28

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: Colorado Department of Health

Date: 10/9/91

July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 3, pg. 5, ¶2	Furthermore, a rated detection limit should not be used for any measurement that fails to achieve the stated degree of sensitivity.	The RFP is also trying to increase the sensitivity of measurements.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 3, pg. 5, ¶3	With regard to another statement in Section 3.2.4 Reporting Practices for Radiochemical Data (p.27), and a statement in Section 4.3 (p. 59), accuracy is achieved through sensitivity, precision, specificity and reproducibility. Bias is ordinarily introduced when the analysis technique lacks adequate specificity, but may be subject to other parameters that affect the overall validity of a measurement technique.	RFP concurs. Sections were rewritten to improve clarity.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 3, pg. 5, ¶4	We disagree with all three highlighted conclusions that are listed in Section 3.3.2 (p. 35) and discussed throughout Sections 3.3.2 (pp. 35-37), 3.3.3 (pp. 37-40), and 3.3.4 (pp 41-42), and in Appendix II. The sensitivity and number of measurements shown in Tables 3.2, 3.3 and 3.4 (p. 36) are not extraordinary, and most importantly variances, standard deviations or some other measure of variability, or p-values, are not present to support the conclusions. While averages may be of interest, no discussion defines the usefulness of the information. Ranges and quartiles may better help to evaluate the need for treatment prior to discharge or for improvements to existing treatment.	<p>This section was rewritten in the revised Workplan to reflect more conservative interpretation of the data. RFP believes that the available analytical measurements for Pu and Am suffer from high relative uncertainty making comparisons of sample populations difficult. Qualified interpretations are presented in Appendix II for these analytes for the sake of completeness.</p> <p>The statistical analysis was based on a historical data set for which the analytical laboratory reported actual concentrations (positive or negative) whether or not they were below the MDA. Conclusions from this analysis are based on the assumption that the reported concentrations provide a true representation of the actual levels of radiochemical concentrations present in the water samples drawn from the various locations. Detailed results of the statistical analysis are found in Appendix II. ANOVA p-values and standard deviations are included.</p>

Record of Response to Comments

Page 23 of 28

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: Colorado Department of Health

Date: 10/9/91

<p>July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 3, pg. 5, ¶5</p>	<p>The reference to Section 3.3.3 (p. 39) to "analyses conducted near ...MDA" is unacceptable; reported averages in Table 3.6 (p. 39) and 3.7 (p. 40) are about 40 times lower than the MDAs reported in Section 3.2.4 Reporting Practices for Analytical Data (p. 28) and about 10 times lower than the MDAs reported in Table 3.1 (p. 29). The reported average americium concentrations in Table 3.7 (p. 40) are at least as high as the reported plutonium concentrations in Table 3.6 (p. 39). If the implied ratios are not to be believed, and they are not, then the statistical evaluation is flawed. Similarly, if the numbers of measurements and the statistical procedures are adequate, then Tables 3.6, 3.7 and 3.8 (pp. 39-41) should not be littered with reported averages concentrations that are less than zero.</p>	<p>RFP interprets the key issue to be inadequacy of current analytical approach at providing timely and accurate Pu and Am data with which to assess and demonstrate compliance with standards, or to evaluate treatment methods.</p> <p>This section was rewritten in the revised Workplan to reflect more conservative interpretation of the data. RFP believes that the available analytical measurements for Pu and Am suffer from high relative uncertainty making comparisons of sample populations difficult. Qualified interpretations are presented in Appendix II for these analytes for the sake of completeness.</p> <p>When single-point exceedences are found, the MDA provides a defined lower limit of quantitation. The CWQCC standards are less than RFPs MDA for several analytes. Averages are 10-40 times lower than the MDAs because the value used is really an "estimate" of the measured activity minus the average background level. Since these are only estimates, they have a measurement error which can be computed and may result in negative values (not statistically different from zero). Mathematically, it is not incorrect to have negative values; reporting of negative or zero values is in accordance with standard EPA and DOE practices (see above).</p>
<p>July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 3, pg. 5, ¶6</p>	<p>The statements about replicate analysis and improved sensitivity in Section 4.0, Workplan Issues, (p.47) indicate a failure to understand the fundamental techniques of analytical chemistry. Replicating analysis will not improve sensitivity; it only provides a duplicate of an insensitive analysis. Cross contamination and laboratory errors do not increase with improving sensitivity, increasing sample volumes, replicate analysis or increasing data collection times.</p>	<p>This section was apparently confusing because the issue of concern was analytical variability/uncertainty. Section 4.0 and the subsequent sections of the revised Workplan were rewritten to more clearly communicate the intent of the proposed options and to provide increased detail. Section 4.3 of the revised Workplan more fully explores approaches to improving analytical performance vs. the CWQCC requirements.</p>

Record of Response to Comments

Page 24 of 28

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: Colorado Department of Health

Date: 10/9/91

July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 3, pg. 5, ¶7	The need for extreme sensitivity appears to be forgotten in the Section 4.0 Workplan Issues (p. 47) discussion of ambient concentration characterization. The Rocky Flats Plant's current measurement techniques and statistical analysis are inadequate to characterize ambient actinide concentration either on-site or off-site and would not be able to attribute any significance to the findings that are sought in Section 4.2 (p. 56).	Workplan Section 4.3 was rewritten to propose analytical methodologies and data quality improvements which would allow ambient characterizations and comparisons. RFP concurs that inadequacy of analytical methods hinders the demonstration of compliance, development of treatment, and the decision-making process, and is a key Workplan concern.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 3, pg. 6, ¶2	In light of this review the statement in Section 3.2.4 Analytical Method Limitations (p 30) should be corrected to read, "The accuracy and reliability of routine plutonium and americium data that are produced by the Rocky Flats Plant laboratories below this value are questionable," or the statement should be omitted entirely. The statement is repeated in Section 4.0 Workplan Issues (pp 46-47) and should be modified accordingly.	This section was rewritten and omits the sentence in question. The rewrite may be found in Section 3.2.2.1 (Reporting Practices for Radiochemical Data) of the revised Workplan.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 3, pg. 6, ¶3	The statistical evaluation in Sections 3.3.2, 3.3.3 and 3.3.4 (pp. 35-42) and Appendix II, together with the conclusions that have been drawn in other parts of the workplan, quite obviously rely exclusively on measurements that have been reported without regard to lower limits of detection. Since the workplan places so much reliance on such information it is difficult to understand what place any discussion of detection limits has in the workplan or what value is placed on them.	RFP concurs with this comment relating to the large relative uncertainty in radiometric values for Pu and Am. Statistical analyses were based on a historical data sets for which the analytical laboratory reported actual concentrations (positive or negative) whether or not they were below the MDA. Conclusions from this analysis are based on the assumption that the reported concentrations provide a true representation of the actual levels of radiochemical concentrations present in the water samples drawn from the various locations.

Record of Response to Comments

Page 25 of 28

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: Colorado Department of Health

Date: 10/9/91

<p>July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 3, pg. 6, ¶4</p>	<p>Figures 3.1 (p. 24) and 3.2 (p. 25), and the narrative in Sections 3.2.7 (p. 33) and 4.1.6 Single Sample Exceedences (pp 51-52) do not describe any attempt to reconcile the first and subsequent analysis results when adverse information is obtained. When anomalous analysis results are obtained it is a generally accepted practice to recheck and verify data. However, if the Rocky Flats Plant's General Radiochemistry and Routine Analytical Services Protocol, GRRASP 9/14/90 Rev. 1.1, referenced in Section 3.2.4 Analytical Method Limitations (p. 31) is to be believed, then the probability of sampling or analysis error is infinitesimal; all reported results would be valid on the first pass without need for verification. Anomalous information that is adverse should be expected to occur with the same frequency as anomalous information that is not; anomalous results must not, repeat not, be defined simply as any adverse information. It must also be pointed out that it is an unacceptable practice to keep resampling and reanalyzing until a desirable result is obtained, unless there is a justifiable rationale for doing so.</p>	<p>Due to the continuously changing water ecology at the ponds (evaporation, precipitation, seepage, inflow, etc.) it is not feasible to merely resample and obtain the same representative sample or duplicate of the original water sample. For this reason, resampling is not done; however, any remaining aliquots of sample may be subjected to analysis. While the goal of a QA/QC program and the GRRASP is to eliminate all possible sources of error, that is not possible 100 percent of the time, primarily because humans conduct the tests. Therefore, in combination with the QA/QC program and the GRRASP, the validity of questionable results is examined closely to detect possible error. Also, recent data obtained by routine sampling in non-discharge conditions, is compared to the originally questionable result to determine if there was a possible error or new data pattern.</p>
<p>July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 3, pg. 6, ¶5</p>	<p>Section 3.3.3 (pp. 37-41), titled "Assessment RFP Water vs. CWQCC Stream Standards," repeats conclusion drawn in Section 3.3.2 and compares average measured plutonium concentrations in community water supplies with the Water Quality Control Commission's surface water standards in Tables 3.6, 3.7 and 3.8 (pp. 39-41). It may be useful to construct this section so that it provides the information referenced in the title.</p>	<p>This section was rewritten to focus on the comparison between the CWQCC stream standards and RFP waters.</p>

Record of Response to Comments

Page 26 of 28

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: Colorado Department of Health

Date: 10/9/91

July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 3, pg. 6, ¶6	The section on analytical quality control, Section 4.1.7 (p 54), is surprisingly short. Where it is stated that "Quality control checks of analytical methodology will .. " does it mean that the method must be validated repeatedly?	Appendix IV (the Quality Assurance Addendum to the Rocky Flats Plant Quality Assurance Project Plan) of the revised Workplan is an addition to this document which was included to describe all of the sampling protocols and standard operating procedures (SOPs) that are used at the RFP. A valid quality control program does require continual checking and verifying of analytical methods to determine that the method is being followed correctly.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 3, pg. 6, ¶7	With regard to the standardized methods cited in Section 3.2.4 Analytical Method Limitations (pp. 30-31), 4.3 (pp.58-59), and 4.3.1 (pp 59-60), the Radiation Control Division does not advocate strict adherence to standardized methods. Such a practice will in the long run inhibit improvements to analytical procedures. The method numbers cited twice in Sections 3.2.4 Analytical Method Limitations (p. 30) and 4.3.1 (pp. 59-60) are irrelevant to this workplan.	The RFP is subject to audits of procedures and extensive public and regulatory agency scrutiny therefore must strictly adhere to standardized methods. Standardized methods exist because they have been proven to be the most accurate way to conduct an analysis with duplicate results. The information contained in the Appendix IV of the revised Workplan provides an example.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 3, pg. 7, ¶1	Considering the inadequacy of measurement techniques employed by the Rocky Flats Plant, evaluations of the treatment technologies described in the Executive Summary (p. ix), Section 3.4 (pp. 42-45), and all parts of Section 4 (pp 46-65) are not expected to provide accurate information if treatment technologies are tested in situ or if bench-scale testing of treatment technologies at Rocky Flats evaluates removal of material in the relevant range of concentrations.	Potential treatment techniques are those proposed by EPA as BAT. Assuming availability of analytical technology, evaluation will be made for treatment effectiveness. Several proposals to improve the analytical methodologies and detection limits at the RFP are detailed in the revised Workplan, Sections 4.3 and 4.4.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 3, pg. 7, ¶2	Uranium, which may present hazards to researchers, would be no better an indicator of removal-efficiency than iron or sulfate. Uranium, nor iron or sulfate, are acceptable substitutes for plutonium or americium in the analysis of chemical treatment technologies due to dissimilar chemical properties.	The potential for the existence of Pu/Am as colloids places importance on the characterization of radionuclides as described in the revised Workplan, Section 4.4.2 (Characterizing Radionuclides).

Record of Response to Comments

Page 27 of 28

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: Colorado Department of Health

Date: 10/9/91

<p>July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 3, pg. 7, ¶3</p>	<p>The conclusions presented in Section 3.4.1 Sample Filtration/Filter Bag Evaluations (pp. 42-43) conflict with those presented in Section 3.4.2 Speciation and Low-Detection-Limit Study (p. 45). In the first case a study of a particle-size filtration system failed to provide conclusive results, probably due to inadequate sensitivity and precision in the measurements. In the second case an LANL study of a particle-size filtration system did provide conclusive results. Assuming that LANL can reliably measure concentrations of plutonium and americium in the relevant range, the results of the LANL project can be taken at face value and agree with expectations.</p>	<p>The LANL work with adsorbants as a filter aid may well agree with expectations.</p>
<p>July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 3, pg. 7, ¶4</p>	<p>Section 2.4.1 (p. 11) states that Walnut Creek flows "offsite through a diversion ditch bypassing Great Western Reservoir" Walnut Creek flows off the property; Broomfield Diversion Ditch begins east of Indiana Street.</p>	<p>The last paragraph of Section 2.4.1 (Natural Drainages) was rewritten to clarify the description of the Walnut Creek drainage basin, the natural flow of Walnut Creek to Great Western Reservoir, and the Broomfield Diversion Ditch. Figure 2.5 was enlarged to provide increased detail, and does show the Broomfield Diversion Ditch located east of Indiana Street.</p>
<p>July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 3, pg. 7, ¶5</p>	<p>Section 3.2.6 (p. 33) states that the Broomfield Diversion Ditch "is not tributary to Walnut Creek..." In fact, the Broomfield Diversion Ditch does feed Walnut Creek. Dry Creek Valley Ditch and Walnut Creek run together for some distance in the original Walnut Creek stream bed, then split. Flow to the two streams is monitored and controlled by the City of Broomfield personnel.</p>	<p>The last paragraph of Section 2.4.1 (Natural Drainages) was rewritten to clarify the description of the Walnut Creek drainage basin, the natural flow of Walnut Creek to Great Western Reservoir, and the Broomfield Diversion Ditch.</p>

Record of Response to Comments

Page 28 of 28

Document Reviewed: Draft Workplan for Control of Radionuclide Levels in Water Discharges from the Rocky Flats Plant, April 5, 1991

Document Reviewer: Colorado Department of Health

Date: 10/9/91

July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 3, pg. 7, ¶6	Section 4.0 Workplan Issues (p. 47) states, "Only by comparison to ambient levels in local areas removed from potentially impacted zones can the need for action be established." While we agree that contaminant concentrations that are attributable to worldwide fallout are a likely endpoint for remedial activity, it must be remembered that substantially all of the transuranics in the Rocky Flats Plant vicinity originated from Plant operations.	This data was included to show the caution should be exercised with analytical results of numbers are close to zero.
July 3, 1991 ltr RE: COMMENTS: DRAFT... Review 3, pg. 7, ¶7	From our reading of Sections 3.4.1 (p. 42) and 4.4.1 Speciation and Quantitation of Radiochemical Species (p. 62), it appears that the authors of the workplan are not aware of the work of Jess Cleveland, Terry Rees and others. Dr. Cleveland is currently at USGS/Denver Federal Center. Previously he worked for Dow Chemical/Rocky Flats. This group has provided a large body of site-specific information about actinides in the environment at Rocky Flats. The discussion provides no insight into how the information will be used in the context of the Interagency Agreement (IAG), but certainly a literature search is indicated and may save duplication of effort.	The authors are aware of the work by Cleveland et al. Section 5.0 (References) of the revised Workplan cites Rees, Hanson, Hurr, etc. The annual report will contain the latest pertinent references.

ROCKY FLATS PLANT WASTE MANAGEMENT SERVICES
EBASCO TEAM INTERNAL CORRESPONDENCE

EBASCO	DAMES & MOORE	SAIC	S.M. STOLLER CORPORATION
DATE:	February 19, 1991	REF:	RFEV10-SMSC-EDEN-M011
TO:	Preston Chiaro	LOCATION:	Denver
FROM:	Allen Crockett	LOCATION:	Boulder
SUBJECT:	Draft Standard Operating Procedures 5.0: Ecology		

Enclosed please find Draft Standard Operating Procedures (SOPs) for sampling biota as part of the Environmental Evaluation (EE) process at Rocky Flats. This submittal represents the second draft of these documents and includes comments and suggestions made by EG&G on the first draft (submitted January 23, 1991).

The work was completed under a COT to BA 66739EB dated November 20, 1990. Further work on biota SOPs and development of field sampling programs at Rocky Flats will be done under Modification 003 to contract BA 66739EB. This work will include development of an SOP for designing field sampling plans, selecting reference areas, recording and managing data, preserving and handling samples, conducting laboratory studies, and incorporating field QA/QC. It will also include development of SOP Addenda for existing EE workplans and technical support for implementing and integrating the EE workplans for different OUs.

Please let me know if you have any questions.

cc:	Doug Cushing	-	EBASCO	Mike Raudenbush	-	Stoller
	Jean Tate	-	EBASCO	Dorothy Morse	-	Stoller
	Frank Mangold	-	Dames & Moore	Ron Foster	-	Stoller
	RFEV/Chron	-	EBASCO	Mark Lewis	-	Stoller
	RFEV/Project	-	EBASCO	Brian Caruso	-	Stoller
	RFEV/Project	-	Stoller	Judy Flook	-	Stoller
	ABC - Chron	-	Stoller			

attachment

ADMIN RECORD

REVIEWED FOR CLASSIFICATION/UCNI

By [Signature] 10/17/91 ANAL
Date 10/17/91